The Mining Journal

LONDON, JULY 10, 1959

Vol. 253. No. 6464. Price Ninepence

The Mining Journal

London, July 10, 1959

In this issue . . .

Vol. 253 **No. 6464**

Established 1835

DISPUTE IN THE PRINTING INDUSTRY

The dispute in the printing industry, the duration of which at present cannot be foreseen, is severely hampering the production of all British newspapers and periodicals, other than national daily and Sunday newspapers. In consequence, the size of *The Mining Journal* must, unfortunately, be substantially reduced until conditions are back to normal.

Published each Friday by

THE MINING JOURNAL LTD.

15 WILSON STREET, LONDON, E.C.2

Telegraphic Tutwork London — *Telephone* MONarch 2567 (3 lines)

Annual Subscription £3 5s. Single copy ninepence

British Mining Machinery on Show

THE year 1957 was a peak for capital expenditure by the mining industries of the Free World. During 1958 and early 1959, capital expenditure tapered off very little in total in the face of a market recession which affected practically all minerals but which, aside from coal, was characterized more by falling prices and a run down of consumer stocks than by any major recession in consumption. If we take account of expenditure in Communist *bloc* countries as well, world capital expenditure has almost certainly been rising since 1957 for mining as a whole, while for coal, in particular, the expansion of production in the Communist countries—notably in China—appears to have considerably more than offset cutbacks in the output of the Western countries.

Capital investments in mining are inevitably long-term projects. Mining companies cannot therefore allow themselves to be influenced by short-term market fluctuations in planning their capital expenditure programmes ahead. They must take the long view, and in the long view the world outlook for mining is strongly bullish.

Over the next twenty years, the population of the world is expected to expand by about 30 per cent above its present size and by the end of the century by 100 per cent. Thus even if, in face of this vast expansion, we discount any continuation of the upward trend in living standards, a sharply rising long-term demand for most minerals seems assured. It is this prospect which has been the stabilising influence on capital expenditure in the mining industry.

It is also this prospect which makes the Mining Machinery Exhibition, which opened at Olympia on July 9, such a timely event, and one which may well provide the stimulus for a re-appraisal around the world of the British manufacturer's capacity to equip speedily, efficiently and at competitive prices, almost any type of mine anywhere in any country. For this reason, it has been our purpose in compiling the Exhibition supplement, which accompanies this issue, to project to our predominantly overseas readership something of the impact which the Exhibition is making on the visitor.

In the post-war period two conflicting influences have been making their impact on the British mining machinery manufacturer. On the one hand, Britain's nationalized coal industry has, until a year or so ago, been making insistent, and on the whole expanding, demands on the manufacturer—demands which in the national interest have been given priority. This has been beneficial in that it has lead to an expansion both in the number of British manufacturers, who have applied themselves to the problems of mine mechanization, and also in overall productive capacity. It has also lead to some build up in design and development facilities. On the other hand, in the context of Britain's mining machinery exports, it has been harmful, because until recently so much engineering genius and factory capacity have been focused on the often specialized requirements of British coal mining, that in some cases exports tended to suffer in respect of delivery and of the intensive sales effort, both technical and commercial, which such markets require.

Happily, in contrast to this picture, there has for some time been a growing realization among mining men of the interdependence of technical progress in coal and metal mining, which makes this Exhibition of universal interest to the mining industry. This trend, which is clearly emphasized by the papers and attendance at the Symposium on Shaft Sinking and Tunnelling taking place concurrently with the Exhibition, ensures that even though this Exhibition owes its aspiration mainly to coal, much of it nevertheless is of universal interest to the mining industry.

The ability and readiness today of British mining machinery manufacturers to serve both coal and metal mining is readily apparent from the exhibits devoted to drilling, to roof support, to underground materials handling, transportation and hoisting, to electrical control gear, to ventilation, pumping and drainage, and to illumination, as well as to the generation and transmission of compressed air, electric and hydraulic power. The exhibits in each of these groups have an immediate and world-wide application, with interest centering perhaps more particularly on the several exhibits devoted to the use of hydraulics underground both in power transmission and control gear and also on the wide range of roof props and self-advancing support systems which are on view.

On the other hand, with the bulk of coal being won overseas by shortwall and room-and-pillar methods, either due as in the United States to strata conditions or, in countries with low wage rates, to the attractiveness of a high investment in labour and a low investment in machinery, some British manufacturers of face machinery are facing problems of fundamental redesign of product or replanning of mining method to suit these extensive overseas markets. This challenge will, no doubt, result in some instances in the development of basically new machines, although there is undoubtedly some scope for replanning shortwall and room-and-pillar mining methods to utilize all but the largest and most specialized longwall equipment in the same way as the British coal industry had to adapt itself to the use of American shortwall equipment during and immediately after the last war.

In many cases, price and availability are going to be the deciding factors, and it seems clear that the N.C.B.'s present need to minimize cost per ton rather than maximize O.M.S. will be reflected in a greater demand for low-cost face machinery flexible in use and capable of producing larger and cleaner coal. This should lead to some simplification of design and scaling down of machine size. This should in turn assist exports not only to those European countries where longwall mining is also practised extensively, but also, as production requirements and wage rates rise, to those less industrially developed areas of the world where mechanization is still at an early stage so that methods can profitably be adapted to the machine, if capital expenditure can thereby be reduced.

Considering the Exhibition as a whole, exhibitors appear to have been less conservative than at other recent European exhibitions and it is notable that in addition to a comprehensive display of equipment which has already been well-tried in the field, much equipment is on show for the first time, which has only got beyond the prototype stage in the last year or so. Nevertheless, in so far as a major purpose of the Exhibition must be to draw attention not only to the achievements but also to the potential of the British mining machinery industry, it is a pity that the industry's undoubted capacity for adjusting itself to the requirements of new markets could not have been underlined more forcefully at Olympia.

For example, in China we have a potentially vast market for mining machinery and it is common knowledge that China is to go in for hydraulic mining and transportation on a large scale. If Oriental visitors prove to be as numerous as at other recent European exhibitions, this should surely have been the occasion for an impressive display of hydraulic mining equipment, or, where this was not available, at least for a display which emphasized the British manufacturer's awareness of the opportunity and his experience in parallel fields such as tin mining and the china-clay industry.

HORNS OF A MINERALS DILEMMA

The Eisenhower Administration, so far as its minerals policy is concerned, now finds itself in the unenviable position of being subjected simultaneously to the appeals from the domestic mining industry for new assistance programmes and to pressure from Congress for the reduction of Government commitments for the purchase of strategic metals.

U.S. fluorspar, chromite, antimony and tungsten mine operators have requested Government subsidies, purchase programmes and incentive payments, so that western mines can return to production. They have asked for guarantees of an appropriate share of the U.S. market for domestically produced minerals and have urged that the Government discontinue bartering farm products for foreign minerals. Producers of manganese and cobalt have also appealed for a variety of new assistance programmes, including tariffs and quotas, various types of purchase programmes and, in some cases, outright subsidies.

U.S. mineral producers blame their present difficulties on increasing development of minerals production overseas with U.S. funds. In the words of Mr. Robert S. Palmer, executive vice-president of the Colorado Mining Association, U.S. grants in aid and loans built up big minerals production in many nations in direct competition with U.S. minerals producers and at lower cost. Apart from additional stockpiling programmes, however, it is difficult to see how the Administration could assist the domestic mining industry without harming overseas producers who have been encouraged to step up output and capacity to meet the requirements of U.S. minerals policy, and so antagonizing friendly countries—as has already occurred with the lead-zinc quotas.

As for any extension of domestic purchasing programmes and stockpiling activities, these are unlikely to be sanctioned by the present Congress. In fact, the House Appropriation Subcommittee has just recommended cuts in the funds to be made available for purchasing strategic metals under the Defence Production Act, and there is considerable speculation in Washington as to the effects of the possible cutbacks in the putting of aluminium, nickel, cobalt, copper and some other metals.

MINING EXPANSION IN POLAND

Under an agreement recently signed in Moscow on U.S.S.R. aid in the development of the Polish oil and gas industries and in non-ferrous mining, the U.S.S.R. will supply Poland during 1959-64 with technical aid and equipment for drilling and prospecting. It is proposed to drill at greater depths than hitherto, up to approximately 4,000 metres. Fifty sets of drilling equipment will be received from the Soviet Union, deliveries to begin in 1959. Fifty installations for the drilling and extraction of copper are to be provided by the U.S.S.R. during the period 1960 to 1963.

The Permanent Committee for Economic, Scientific and Technological Co-operation in Metallurgy, at a recent session in Moscow, made recommendations for increasing the production of various metals and coke and extraction of iron ore in member countries of the Council of Mutual Economic Aid during the period 1959-65. Among the countries participating in this session was Poland.

Soviet Metal Resources

WRITING in a special jubilee number of the Soviet journal *Gornyi Shurnal* and quoted in the West German monthly *Metall*, A. A. Amiraslanov, a corresponding member of the Academy of the Sciences of the U.S.S.R., gives a full picture of Russia's metal reserves as they stood at the end of 1957. The Soviet Union, he claims, possesses some of the world's greatest copper reserves, the most important of these being located in the Uzbek, Altai, Gau Krasnoyarsk and Murmansk regions.

Of the varieties of raw materials from which copper is produced copper pyrites are present in various parts of the U.S.S.R. in large quantities, where zinc, sulphur, cadmium, gold, silver and arsenic as well as copper are contained materials, and also in some cases lead, selenium, tellurium and other trace elements. The copper content of Russian pyrites is in many cases higher than that of foreign pyrites. Copper-molybdenum ore, discovered, experimented with and later worked in Kazakhstan, the Uzbek and Armenia, is situated barely beneath the ground surface and may be mined by opencast methods. Metallic content of the mined material is small, but the ore is used to a comparatively large extent. Cuprous sandstone is found in various areas, but only in commercial quantities in Kazakhstan. Lead, zinc, silver and gold are also sometimes present in small quantities. Mining copper ore in fistular form is difficult owing to the conditions present at the reserve locations. The ore contains also sulphur and precious metals. Other types of ore (including cupro-nickel ore) make up 16 per cent of all copper sources worked. They contain also nickel, cobalt, platinoids, other trace elements, vanadium, sulphur and zinc.

Percentage of Copper From Various Sources

	1938	1957
Cuprous sandstone	6.1	25.8
Copper pyrites	82.7	36.9
Copper-molybdenum ore	—	20.2
Fistular copper ore	2.3	1.1
Other sources	8.9	16.0
	100.0	100.0

Lead and zinc are produced mainly in Kazakhstan and the mid-Asiatic Republics. Many new reserves have recently been discovered and it is expected that further research here and elsewhere in the U.S.S.R. will result in the determination of yet further occurrences. Lead and zinc ores of the Altai type are found in the Altai area, also in Kazakhstan, Armenia, Siberia and the Ala-tau region. These ores are deposited mainly in areas of volcanic sedimentary rock and are mainly in the form of inclusions. Cuprous zinc ore is to be found in the Urals. The flanking rock of these ores is sulphurated and quartzated to the extent of bearing quartzites. As well as lead and zinc, copper, sulphur, cadmium, gold, silver and various trace elements are present in the ores. So far as lead-zinc ore in carbonated rock is concerned, dolomite, dolomitized limestone and limestone itself have been discovered in Kazakhstan and elsewhere to contain this ore, although considerably less lead is now obtained from these sources than before the last war. Lead-zinc deposits in fistular form, caused by contacts of limestone and granite in areas of great geological disturbance, are to be found not only at contact points but also some distance away, mainly in carbonated rocks. Exploited in mid-Asiatic Russia and Kazakhstan, these contain apart from lead and zinc, gold, silver and trace elements. Other deposits include those in lead- and copper-content sandstone, lead-zinc ores in volcanic rock, sandstone and very old metamorphosed crystalline rock. These other sources occasionally contain sulphur, gold, silver and trace elements as well as lead and, less frequently, zinc.

Percentage of Lead and Zinc From Various Sources

	Lead		Zinc	
	1938	1957	1938	1957
Lead-zinc ores (pyrite type) ...	25	44	63	65
Lead-zinc ores (car. rock) ...	49	21	—	16
Fistular lead-zinc ores ...	12.5	18	15.7	12
Other sources	13.5	17	21.3	7
	100.0	100.0	100.0	100.0

Nickel mining and refining has been going on in the Urals and in the Murmansk area since 1933 and the Soviet Union is now the world's second largest nickel-holding country. Before the last war silicate nickel ores were in the ascendant; now 77 per cent of all ore mined is sulphidic and produces 64 per cent of the refined nickel total.

Situated in Kazakhstan, Yakutia, in mid-Asiatic Soviet Republics and elsewhere, Russia's tin reserves are claimed as the world's largest. Reserves are 80 per cent in the form of sulphidic cassiterite ore, 19 per cent present in veins of quartz and 1 per cent in pegmatites. Of the tin refined, 95.5 per cent is taken from the first of these bases and 4 per cent and 0.5 per cent from the other two, respectively. Formerly, much of Russia's tin came from drift sand, but only 9 per cent now is based on this source.

Up to 1938 the U.S.S.R. possessed only negligible reserves of molybdenum; since then discoveries in the Caucasus, Kazakhstan, the Transbaikal Republic and elsewhere have put Russia into the second position in the world for reserves of the metal—the first place, says Mr. Amiraslanov, taking into account the poor quality of foreign ores. In 1957 25.7 per cent of the country's molybdenum came from copper-molybdenum ores, 24.2 per cent from inclusions in volcanic rock, 26.3 per cent from fistular deposits of molybdenum with scheelite and 23.8 per cent from deposits in quartz veins. Up to 1938 this last was the most important source. More deposits are expected to be discovered over the next few years.

Neither the mercury nor the antimony at present on hand in the Soviet Union is at present qualitatively good enough to satisfy the authorities; particularly is this so in the case of mercury. Concentrated research and exploration is going ahead to improve the situation. Present deposits are situated in the Ukraine, the mid-Asiatic Republics and elsewhere.

Mining operations for tungsten, which is found in Kazakhstan, Mongolia, the Kirghiz Republic and elsewhere, began in 1930. Although most of the deposits in Russia consist of poor-quality, interstratified ore, the Soviet Union holds second place to China only for stocks of the metal. Some 61 per cent of the country's tungsten is produced from fistular ore and most of the rest (37 per cent) from quartz veins. Russia's reserves permit an unlimited exploitation of the metal, though the low metal content of the ore gives rise to the need for further research in this field.

Bauxite reserves have been discovered in the Urals, Kazakhstan, in the Leningrad and Sologodski regions, in the Ukraine, Siberia and the Krasnoyarsk area. The rich nephelite deposits near Murmansk are being exploited as part of the aluminium production programme, and in 1957 work was about to begin on the exploitation of the alumite deposits of Azerbaijan. Under the same programme research is going into the potentialities of sillimanite, andalu-

site, diaspores and other forms of alumina in various parts of the U.S.S.R. The bauxite deposits have risen to nearly ten times those established in 1938. Unlike other countries, Russia has started to make use of new raw materials in the production of aluminium—like nepheline—and is testing alumite and sillimanite for this end. A large part of the Soviet Union's bauxite reserves have a good modulus and bauxite is one of the country's richest ores.

Apart from the above-mentioned minerals, Russia is rich in raw materials for the production of such rare metals as niobium, tantalum, zircon, lithium, beryllium and strontium and full-scale development of these metals is now in progress.

As for the future, the five-year plan at present current (1956-60) is expected to increase the established reserves of nickel ores by 30-35 per cent of copper, bauxite and titanium ores by 40-45 per cent, niobium by 50-55 per cent, lead and zinc by 55-60 per cent, molybdenum by 65-70 per cent and mercury by as much as 75-80 per cent. Russia's general development in the production of metals could be gauged by the fact that at the start of the First World War the country was producing only 2,000 tons of lead, 30,000 tons of copper and a certain amount of gold annually.

In his article, Mr. Amiraslanov gives no production or reserve tonnage figures for the metals under review.

TURKEY—II

Turkey's Mineral Industry

This article is based on a survey by L. Nahai, entitled "The Mineral Industry of Turkey", issued by the Bureau of Mines, U.S. Department of the Interior, as Information Circular 7855.

A DOZEN or so minerals are mined in Turkey, those of importance (other than construction materials) being coal, chromite, copper, and iron ore. The contribution of the mining industries to the gross national income still lags considerably behind that of agriculture and manufacturing. The most important mines are owned and operated by the State, but the share of private industry in mineral output is gradually increasing. Some mines are of medium size, but the majority are small and not mechanized.

Development of the industry is still hampered by expensive internal transportation, insufficient foreign exchange to purchase equipment for the mines, and inadequate basic geological information to guide development and planning.

Agencies Concerned With Minerals

The State, operating through the Eti Bank, is the largest producer of metals and minerals in Turkey. The Eti Bank was established in 1935 and has an authorized capital of £T500,000,000, of which £T232,010,000 is paid up. By law, it is authorized to buy and sell mineral ores, operate mines and quarries, or participate in such ventures. It owns Turkey's most important mines: Zonguldak coal mines, West lignite mines, the Güleman chrome mine, Ergani and Murgul copper mines, the Keciborlu sulphur mine, and Keban lead-zinc mine. Some of these properties were acquired by purchase of concessions given previously to foreign companies; others were started by the government as a result of exploratory work by its own mineral agencies.

Iron and steel are produced by the Turkish Iron and Steel Association, which is also a State enterprise. Since May, 1955, this corporation has operated the Divrigi iron mine, formerly an Eti Bank holding.

Under the Ministry of Industry, the Maden Isleri Genel Mudurlugu (Mines General Directorate) administers the mining law and leasing.

Geological mapping and exploration for minerals are carried out by the Maden Tetkik ve Arama Enstittusk (MTA) or Mineral Research and Exploration Institute, which was established in 1935. Effective July 1, 1957, MTA was transferred to the Ministry of Industry, which was created in May that year.

Maden Tetkik ve Arama has prepared a geological and tectonic map of Turkey to the scale of 1 : 800,000 and has completed 444 geological map sheets of 1 : 100,000. During its 21-year life, the institute has amassed an impressive volume of information on the geology and mineral resources of Turkey, and it has been instrumental in finding many of the mineral deposits now being worked.

Installation and rights of MTA in the Raman and Garzan oilfields, which it discovered and developed, and operation of the new government-owned petroleum refinery in Batman, were taken over in 1954 by the Turkiye Petrolleri A.O. (Turkish Petroleum Corporation), in which the State owns 51 per cent of the capital. Except where specified to the contrary by company statutes, the Turkish Petroleum Corporation is governed by private commercial law.

The exact value of minerals and metals produced in Turkey is not known. Excluding construction raw materials and cement, it probably amounted to about £T450,000,000 in 1956, or about 2.4 per cent of the 1955 gross national product. Coal and lignite accounted for 47 per cent; chromite, 19 per cent; copper, 14 per cent; iron ore, about 3 per cent; and other minerals, 17 per cent.

There is no reason to believe that in the immediate future minerals and metals traditionally produced in Turkey will increase materially from the 1953-56 output. On the contrary, the maximum production of manganese and chromite attained in 1953 has not been maintained, because of the drop in demand and competition from other suppliers. However, the production of coal and petroleum should continue upward, and some items, such as tungsten and molybdenum, may be added to the minerals produced in Turkey.

During 1950-56, Turkey produced from 16.5 per cent (1954) to 21.5 per cent (1951) of the world output of chromite; the entire Turkish production is available for export, and is marketed principally in the United States and Europe. Turkey also has exportable surpluses of copper and quicksilver, iron and manganese ores, pyrites, salt, small tonnages of ores of antimony, lead and zinc; and a few non-metallic minerals. In terms of world output, however, Turkey's production of these non-chromic commodities is insignificant.

In addition to the commodities mentioned above, Turkey is self-sufficient in various construction materials, but has to depend entirely on imports for the modest quantities of non-ferrous metals required by the predominantly agri-

cultural economy. These metals are consumed in semi-finished forms and in quantities too small for economic production. The country must also meet part of its iron and steel requirements from abroad, mainly in the form of rolled products. Among non-metallic minerals, the most important deficiencies exist in potash and phosphate. In fuels, Turkey is self-sufficient in coal, but must import almost all its petroleum requirements.

Mineral Resources

The metallurgical industry consists of one iron and steel plant, two copper smelters, and one small lead smelter. The iron and steel plant, with a capacity of about 150,000 tonnes of finished iron and steel products, meets 50 per cent (quantitatively) of the country's requirements. No rolling mills are available for copper or any of the other non-ferrous metals.

Turkey's mineral exports are important in earning foreign exchange, but the exchange so earned is insufficient to pay for essential mineral and petroleum imports. Metals and minerals contributed 15.7 per cent of Turkey's total exports in 1956.

Turkey could increase its exports of antimony, lead, and zinc ores, pyrites, boron minerals, and salt, on a modest scale, and might also be able to export a few hundred thousand tons of coal to the Mediterranean area. Export markets for iron and manganese, however, are obtainable only in periods of high world demand; emery, meerschaum and quicksilver exports are irregular and depend on the vagaries of the market.

Estimated Turkish reserves of a few commodities are given in the table. None of the reserves, except those of chromite and perhaps tungsten, are large enough to have world significance. Much of the bauxite is high in silica and iron, and of the tungsten reserves 70 per cent carry less than 0.4 per cent metal. Resources are adequate for a modest expansion of the iron and steel industry. More widespread utilization of sub-bituminous coal will help to meet the fuel needs of eastern Turkey, and prospects for discovery of additional petroleum resources are considered promising.

Distribution of the mineral deposits is not ideal. Metallurgical coal occurs only in the Zonguldak Basin, nearly 1,000 km. from the best iron ore deposit. Iron ore deposits closer to the coal basin cannot be utilized economically without beneficiation. Long-haul distribution of coal for other than metallurgical use is also very costly.

Evaluation of the chances for future discoveries is speculative rather than analytical. The Mineral Research and Exploration Institute has been engaged in geological exploration for a comparatively short time, and much of the work has been of a broad regional character. Detailed geological investigations and field mapping remain to be done in much of the country. The outlook for further discovery of ore deposits of sizes comparable to present known deposits may be considered fair, but will depend on active field exploration.

Labour Legislation and Manpower

Turkey's labour legislation is complicated and consists of detailed codes of law relating to employment, working conditions, labour-management relations, and social security. Permanent employment for more than one year must be covered by written agreements. The Ministry of Labour is empowered, where such action is considered necessary, to establish local commissions to fix minimum wages. Strikes and lockouts are prohibited, the management is obliged by law to discuss settlement proposals with workers' elected representatives. Disputes are finally settled by arbitration and adjudication.

Mine workers must be Turkish citizens, but engineers, technicians, foremen, and skilled workers may be foreign nationals, subject to certain stipulations.

The labour force in Turkey is estimated at 8,000,000, of which 12 per cent is employed in industry and mining. The number of people engaged in the mineral industries is not known accurately, but may be 50,000, of which some 31,000 are employed in the Zonguldak coalfield.

Mining machinery is not manufactured in Turkey. The industry's needs for trucks may be met to some extent by the truck-manufacturing plant at Kirikkale. An Austrian firm proposes to construct a plant for manufacturing diesel trucks and tractors and diesel engines for industrial purposes. There are two factories for the manufacture of explosives, but their output is insufficient for all needs.

Imports of mining machinery and supplies are hampered by insufficient foreign exchange, which has necessitated control. Goods can be imported only on the basis of a licence issued by the Ministry of Commerce and Industry.

State and Private Enterprise

Although labour presents no serious problem in the development of mineral resources, lack of private domestic capital willing to engage in this field has been a deterring factor and is one of the reasons for government participation in mining. Traditionally, domestic capital has been more attracted to some other investment fields. Nonetheless, many enter the mining industry during periods of high prices, as illustrated by chromite in the early 1950s, but abandon it when price trends are reversed.

Furthermore, little of the available domestic capital can be converted into foreign exchange to buy equipment and supplies that must be imported. Although chrome exports constitute an important source of foreign exchange, many chrome producers are hampered in their operations because they cannot buy trucks and tyres for transporting ore. To correct this situation, the government recently ruled that a share of the sale of exported ore can be held by the exporter in foreign exchange.

For large integrated mineral activities requiring erection of concentrators, smelters, and rolling mills, the government will remain the principal source of domestic capital in the foreseeable future, because the sums required cannot easily be found in the private domestic money market.

Although it is not government policy to turn over going mining operations to private enterprise, Turkey welcomes domestic and foreign private capital for finding and developing new deposits. Measures designed to improve the legal climate of foreign investment are the Foreign Investment Encouragement Law (approved January 18, 1954) and the Petroleum and Mining Laws.

At present, foreign investment in the mineral industries is principally in petroleum exploration. Foreign investment in non-fuel mining may amount to less than $750,000. Borax Consolidated Ltd., a British company, has been producing boron minerals for many decades. Newmont Mining Co., a United States concern, was engaged in exploration activities during 1954-57.

Three German firms are investing in the iron and steel industry, their total investment being about $1,850,000. A French firm is investing some $750,000 in the production of ferrochrome.

Turkey's more important mineral products will be surveyed in a further article.

MINING MISCELLANY

The Government of Pakistan has established a Bureau of Mines.

★

The World Bank has made a loan equivalent to $35,000,000 for the development of high-grade manganese deposits in Gabon, French Equatorial Africa. The loan, which was received by the Compagnie Minière de L'Ogooue (COMILOG), will be used to buy equipment and services for mining operations, a 45-mile cableway, and an 180-mile railway connection to transport the ore to the coast. Initial production is to be at the rate of 500,000 tonnes annually, which is only a fraction of the estimated reserves.

★

Mattiessen and Heger Zinc Co. of La Salle, Illinois, U.S.A., is to build a zinc smelter and refinery, together with a sulphuric acid plant, at Port Maitland, on the north shore of Lake Erie near Port Colborne, the southern terminus of the Welland Canal. The total cost is estimated at $5,000,000 and production is scheduled to start early next July. Wilfroy and Geco, Ontario's two zinc producers, will benefit from the establishment of the smelter, as will mines in northwestern Quebec. The project will supply sulphuric acid to Electric Reduction of Canada, which has already announced a $10,000,000-$12,000,000 chemical project for Port Maitland. Mattiessen has formed a Canadian subsidiary, known as Sherbrooke Metallurgical Co.

★

The 50th anniversary of the discovery of gold in the Porcupine field in North Ontario was recognized by celebrations held from July 1-4. Since July, 1909, when four claims were staked on the property which subsequently became Dome Mines, bullion valued at approximately $1,300,000,000 has been turned out. This has entailed the mining and milling of over 150,000,000 tons of ore. By far the greatest part of the output has come from three mines which are still in operation—Hollinger, McIntyre and Dome.

★

Lead-zinc deposits have been discovered in Pakistan at Ushu in the Oorgarh Valley of the upper Swat, but they are not thought to be large enough for exploitation on a commercial scale.

★

The Ontario Department of Mines has announced that, after province-wide competitions held in June, the Mine Rescue team representing the Algom Quirke uranium mine in the Elliot Lake district has been declared provincial champion. Second place went to the Bicroft uranium mine team in the Bancroft area, and third place to Geco at Manitouwadge.

★

The total reserves of copper proved so far by the latest geological survey of India are reported to be of the order of 3,370,000 tons. India's output of copper ore in 1958 was 250,000 tons. An intensive survey in the copper belts of Rajasthan, Uttar Pradesh, Bihar and Andhra has yielded encouraging results. The Indian Bureau of Mines is now carrying out detailed investigations at Khertri and Daribo to assess the economic value of the deposits.

★

The American Metal Climax Corporation has acquired options on some 254 mining claims near Safford in eastern Arizona. The agreements provide for a total payment of $3,000,000 if the options are exercised. The claims lie in the same region where Kennecott and Phelps Dodge are exploring copper deposits under similar option agreements.

★

Harvey Aluminium of America and American Metal Climax through its local subsidiary, Caribex Ltd., have conducted preliminary prospecting operations in Jamaica, and the latter company has reported very encouraging results. Government revenue from the bauxite industry, by way of Royalties and Income Tax, amounted last year to nearly £4,500,000.

★

The Japanese steel industry plans to import 10,300,000 tons of iron ore in the current financial year, states the Japan Iron and Steel Federation. This compares with 7,580,000 tons imported in the 1958-59 financial year. The increase in imports is necessary because Japanese steel mills plan to increase the output of pig iron from 6,960,000 to 8,600,000 tons.

★

Republic Steel Corporation has announced the successful production of strip steel directly from powdered iron ore, bypassing such normal operations as coke ovens, blast furnaces, open hearths and blooming mills. The announcement was made during dedication ceremonies for the company's new $5,000,000 research centre at Independence, Ohio.

★

Russian geologists are to carry out a comprehensive exploration of Mongolia in a search for minerals.

PERSONAL

Sir Charles J. Hambro and Mr. W. M. Robson have been appointed directors of the British South Africa Co.

★

Col. The Lord Robins has been appointed a director of Union Corporation Ltd.

★

Mr. W. D. Harverson has arrived in Dar es Salaam, Tanganyika, to take up his duties as Commissioner for Mines in succession to Mr. V. T. Hockin, who has retired. Mr. Harverson was formerly Commissioner for Mines and Geology in Kenya.

★

Sir Alexander Fleck, who will be 70 in November this year, has intimated his intention of relinquishing his position as chairman of Imperial Chemical Industries Ltd. and of resigning from the board on February 29, 1960. Mr. Stanley Paul Chambers has been unanimously elected as his successor.

★

Mr. T. W. Heather and Mr. R. E. Robinson, both assistant managing directors, and Sir Patrick Ashley Cooper, a director, have intimated their desire to retire from the board of the General Electric Co. Ltd. during the current financial year, in order to give opportunities for the promotion of younger men. Mr. A. L. G. Lindley has been appointed vice-chairman and a managing director of the company.

CONTRACTS AND TENDERS

A contract valued at over £1,250,000 has been received by the General Electric Co., as main contractors, for an iron-ore preparation plant at the Redbourn Works of Richard Thomas and Baldwins Ltd., Scunthorpe. The plant is designed for an initial throughput capacity of 1,750,000 tons of iron-ore yearly.

★

Huntington, Heberlein & Co. Ltd. subsidiary of Simon-Carves Ltd., are to build a large sinter plant for Richard Thomas and Baldwins Ltd. at their Redbourne steelworks near Scunthorpe. With a capacity of 32,000 tons of sinter per week (16,000 tons per week from each of two continuous sintering machines), the installation will be one of the major plants in the U.K. Work in the drawing offices is already proceeding.

Dowty Mining Equipment Ltd.'s stand, a feature of last month's Cleveland Coal Show. This, the only British exhibit, has already led to the first orders from American mine operators for Dowty self-advancing hydraulic roof-support systems

Metals and Minerals

World's Largest Beryllium Plant For U.K.

A new company known as Consolidated Beryllium Ltd. is to be formed—subject to Exchange Control consent—by the Imperial Smelting Corporation, the U.K. subsidiary of Consolidated Zinc Corporation, and the Beryllium Corporation of Reading, Pennsylvania, U.S.A. The new company will have an initial capital of nearly £4,000,000 and will be equally owned by the U.K. and U.S. companies. It will be managed by Imperial Smelting.

Consolidated Beryllium will produce nuclear grade beryllium metal and beryllium-copper master alloy as raw materials for sale to fabricators both in the U.K. and in Europe. It will operate the beryllium metal plant now under construction at Avonmouth, which will be in production on a small scale by the end of the year and will be expanded in accordance with future demand.

Beryllium metal at present costs about £40 per lb. Because of its low thermal neutron absorption cross-section, it can be employed in the manufacture of many different types of reactor hardware. Present indications point to the use of beryllium metal in the U.K. designs of gas-cooled reactor as providing the earliest large outlet for commercial production. If current experiments by the U.K.A.E.A. are successful, beryllium could become the standard canning material for gas-cooled reactors from 1965 onwards. Growing interest has also been reported, notably from the U.S. Air Force, in the utilization of beryllium metal as a structural component for aircraft and as a solid fuel for missiles.

In view of the possible future requirements of beryllium metal for use in the U.K. nuclear power reactor programme, the new company is planning the largest beryllium metal plant in the world, to enable construction to begin without delay as soon as a large-scale demand develops. In the meantime, the American partner will provide any metal required in excess of the current capacity of Consolidated Beryllium.

In connection with the new development, which assures future U.K. supplies of one of the most potentially important of the newer metals, reference may appropriately be made to the beryllium fabrication plant under erection by Imperial Chemical Industries at Witton. This plant will produce semi-fabricated forms of the metal which will be used in the cans of the Advanced Gas-Cooled Reactor at Windscale (A.G.R.) and the Hot Experimental Reactor of Zero Power (HERO). This plant will be completed in 1959 or early 1960.

In addition to the beryllium metal plant, Consolidated Beryllium is to start immediately on the erection of a beryllium-copper master alloy plant at Avonmouth to supply an already established market for this material in the U.K., to which the Beryllium Corporation has been exporting for more than a decade. Beryllium-copper is used chiefly in the manufacture of current-carrying springs for electrical and electronic equipment. The beryllium content greatly improves mechanical properties while retaining conductivity.

U.S. FLUORSPAR IMPORTS

In our issue of April 17, 1959, p. 421, we reported that the Senate Interior Minerals sub-committee had started hearings on a Bill which sought to " revitalize " the U.S. domestic fluorspar industry by placing flexible quotas on domestic production and imports. The Senate Interior Committee has now approved this Bill, with a considerable number of alterations.

Briefly, the Bill aims to preserve and develop the U.S. fluorspar industry by guaranteeing domestic producers an American market for 200,000 tons of acid-grade fluorspar and 125,000 tons of metallurgical grade. Imports would be allowed at 80 per cent of their level during the base period years of 1956, 1957 and 1958. The Bill would also set prices for fluorspar. If it wins approval of both the House of Representatives and the Senate, its formula would be incorporated in other bills affecting domestically-mined metals, particularly lead and zinc.

The Senate Group has made two major changes dealing with the proration of quotas and barter deals. It has also inserted an entirely new section which declares that the Bill would not become effective until 60 days after passage by Congress, the purpose of this addition being to give the President time to amend or terminate international agreements affecting fluorspar that might be in effect under G.A.T.T. The two major amendments eliminate the necessity for setting individual quotas for producers and make it mandatory for the Commodity Credit Corporation to undertake barter deals to bring each foreign producing country's quota up to the average of 80 per cent of their entries during the 1956-58 base period.

KOREAN TUNGSTEN EXPORTS

Korea's tungsten exports, which were valued at $2,100,000 in 1958, are reported to have been almost at a complete standstill since the conclusion of the revised sales contract between the Government-owned Korea Tungsten Mining Co. and its exclusive agents, the Continental Ore Corporation of the U.S. As reported in our issue of May 29, 1959, p. 596, this contract sets the minimum selling price at $12.00 whereas ruling international prices have been under $11. The Government refused a request to revise the contract to enable tungsten to be exported at the ruling world prices, on the view that to sell would only depress prices further and that it was better to conserve the natural resource until the price level rose again. As a result, the Korean Tungsten Mining Co., which has been producing tungsten at the rate of 250 tons per month and has built up a stockpile of 2,000 tons, was reported to be in serious financial difficulties. In recognition of these difficulties the Government approved exceptionally, on April 29, an application from the company to export 275 tons at $11 per ton.

ALUMINIUM FOR CHRYSLER PLANTS

Alcan and the Chrysler Corporation of Canada have announced the joint formation of a new company, Chryslum Ltd., which is to process aluminium alloys for Chrysler plants in Canada and the U.S. Chryslum will lease Alcan's smelter at Beauharnois, Quebec, which has a capacity of 30,000 tons. It is reported that Chrysler is preparing to use more aluminium in motor cars, including engine blocks.

COPPER · TIN · LEAD · ZINC

(From Our London Metal Exchange Correspondent)

As far as factors outside the market are concerned it has been a particularly uneventful week, and in consequence values generally have followed the recent trend with copper and lead drifting lower and tin and zinc moving higher. New business has not been coming forward in any great volume, but active trading has been maintained as a result of dealers adjusting their day to day positions.

RENEWED COPPER CUTBACKS COMING ?

In the absence of any improvement in European demand, together with the " bearish " influence of the present statistical position of the metal, the London market began the week on an easier note and both cash and forward copper have declined sharply. This has been accompanied by a further ½c. reduction in the customs smelter price to 29½c. and a lowering in the Commodity Exchange quotation in face of active liquidation. The U.S. scrap price, however, has been maintained during the week at 24c.

Demand for customs copper continues to be extremely quiet, whilst producers report similar conditions at their price of 31½c. or 2c. higher than the customs smelters. It seems unlikely that this span can be maintained, but no doubt every effort will be made to do so pending the outcome of the wage negotiations in the U.S. Dealer metal is on offer at 29⅝c. with sales negligible.

No real progress has been made in the negotiations for the new labour contract which expired June 30. It had recently become increasingly clear that work would continue past this date, and whilst the Union ballot gave the executive the necessary authority to call a strike, if considered necessary, no date has been set. On the contrary, such action will depend entirely on developments in the coming weeks on which the current steel industry wage negotiations will no doubt have an influence and here a note of optimism is discernible. It will be recalled that in this case strike action was put off for two weeks from June 30.

Trade circles generally regard the next two months as a testing time for copper when the market enters the holiday period and consumers will, to a great extent, be

out of the market. Production is running at an all-time high and on an annual basis shows a surplus of some 200,000 tons over consumption, and whilst the economic outlook for the fourth quarter 1959 is favourable, it will require an improvement in consumption to ward off the effects of increasing stocks, both inside and outside the U.S. U.K. stocks in official warehouses increased last week by 451 tons to 14,534 tons.

TIN DEMAND CONTINUES GOOD

Tin continued in good demand both from the U.S. and the Continent, and values in London and Singapore have been well maintained. Offerings of nearby metal on Buffer Pool Account have been well absorbed and it will be recalled that the manager is now in a position to commence disposal of the first 2,500 tons of British Government stockpile metal.

Tin shipments from Singapore in June totalled 102 tons, whilst from Penang the figure was 2,764½ tons. These compare with 15½ tons and 3,998½ tons in May respectively. Stocks in U.S. official warehouses last week declined again to 7,431 tons, a drop of 156 tons.

On Thursday morning the Eastern price was equivalent to £820⅜ per ton c.i.f. Europe.

ZINC STATISTICS ENCOURAGING

Lead demand continues at a routine level and with signs that the influential support for the near position has anyhow temporarily dried up and the satisfactory supply situation has been effected in a widening of the contango. Zinc, backed by a sound statistical position, is a good market with demand from world consuming industries satisfactory. As has been suggested in this column before, a rise in the U.S. price from 11c. would, in all probability, have taken place but for the element of uncertainty created by the possibility of a strike in the U.S. steel industry from which quarter demand is brisk for delivery before July 14.

Figures issued during the week show that zinc consumption in the U.S. at 89,000 tons in April continues to increase, whilst smelter production fell from 79,900 tons in March to 76,400 tons in April. Stocks on hand at smelters were slightly lower at 203,900 tons and consumers' stocks were 6 per cent below the end of March figure. Total lead production in O.E.E.C. countries declined slightly in May to 50,537 tons compared with 51,863 tons in April, whilst zinc production increased slightly to 73,384 tons against 72,216 tons.

Closing prices up to midday, July 9, are as follows :

	July 2		July 9	
	Buyers	*Sellers*	*Buyers*	*Sellers*
COPPER				
Cash	£220½	£221	£214¼	£215
Three months ..	£221¼	£221½	£215¾	£216
Settlement ..	£221		£215	
Week's turnover	11,775 tons		16,875 tons	
LEAD				
Current ½ month	£69½	£69¾	£69	£69¼
Three months ..	£70¼	£70⅜	£70¼	£70⅜
Week's turnover	5,100 tons		7,700 tons	
TIN				
Cash	£790½	£791	£791	£792
Three months ..	£792½	£793	£791½	£792
Settlement ..	£791		£792	
Week's turnover	565 tons		485 tons	
ZINC				
Current ½ month	£80¼	£80½	£79½	£80
Three months ..	£79	£79¼	£79	£79¼
Week's turnover	6,000 tons		7,250 tons	

Mining Finance

Big Nchanga Script Issue

Nchanga Consolidated, one of Anglo American's big Copperbelt producers, surprised its shareholders on Friday by announcing a three-for-one scrip issue. No official reason for this step has been announced, but the "heaviness" of Nchanga stock units at their present price of about 11 must have been an important factor in the decision. One perennial paradox is that many small investors prefer to buy a large number of low-priced units rather than a few high-priced ones, although the proportion of the equity represented by their purchase is the same and the dealing charges may well be more. Because of this, it may be expected that the market in Nchanga will become wider once the issue has been made.

At the same time as the scrip issue announcement, Nchanga released its preliminary results and final dividend for the year to March 31 last. These reflect a copper price rising from the 1958 low of £162, but still, for the most part, under £200, so that the reported increase in operating profits from £4,370,380 to £4,704,535, both figures after tax, is by no means unsatisfactory. The final dividend is 9s. 6d. net, making a total of 12s. 6d. compared with 10s. 0d.

DIAMOND SALES STILL GOOD

Although the June quarter's total of diamond sales through the Central Selling Organization was slightly lower than that recorded for the first three months of the year (£21,611,905 against £23,586,653), neither the gem nor the industrial component can be called unsatisfactory. Indeed, the industrial sales at £6,800,534 are more than twice those for the corresponding period of 1958.*

Quarter	*Gem*	*Industrial*
1958	(£000)	(£000)
June ..	10,735	3,199
Sept. ..	12,845	3,228
Dec. ..	15,327	4,919
Total ..	49,421	16,123
1959		
Mar. ..	15,865	7,721
June ..	14,811	6,801

* It would appear from this that U.S. stockpiling has not fallen away as sharply as had been anticipated.

ARISTON UNDERWRITING SURPRISE

Yield levels on Ghana gold issues continue to reflect the distrust felt by many investors of the policies of the Ghana Government. This is an unfortunate state of affairs, because Dr. Nkrumah's administration has always taken great pains to make known its favourable attitude towards the industry. Indeed, measured in deeds, not words, the record of the Ghana authorities in relation to mining is at least as good as that of most other Commonwealth countries.

The latest example of this benevolent attitude has arisen in connection with the forthcoming rights issue by Ariston, which, it is now announced, is to be underwritten to the extent of 25 per cent by the Ghana Government. This, of course, is no more than a gesture, because there is little likelihood of any Ariston shares being left for the underwriters. In fact, were it at all likely that the issue would fail, there would be room for the more cynical investor to argue that government underwriting is a method of nationalizing by the back door.

Financial News and Results

Yukon Consolidated Disclaimer.—The board of Yukon Consolidated Gold Corporation have issued a statement referring to the announcement which appeared in the Press on July 3. The announcement, says the statement, did not emanate from the corporation, and it does not carry the approval of the directors. The board says that Messrs. Knapp-Fishers have been furnished with certain information, and told that Yukon Consolidated would be prepared to recommend acceptance of the offer of 8s. 6d. per share, provided they were first given satisfactory information on a number of points. This further information, first requested on June 12, has not yet been received.

Phoenix Prince.—Net earnings of Phoenix Prince in the year to March 31 last amounted to £2,385 after tax and depreciation, compared with £5,502 in the 1957-8 financial year. In his statement the chairman, Mr. A. Macquisten, said that opencast working on the main reef outcrop began in August. This should enable the company to further increase its output over the 152,970 tons achieved last year. The total ore available from this source is thought to be "considerable". Meeting, July 27.

LONDON METAL AND ORE PRICES

Due to extreme pressure on space arising from the dispute in the printing industry, we have no alternative but to suspend publication of our usual table of London Metal and Ore Prices, which will be resumed as soon as circumstances permit. Meanwhile any changes in metal or ore prices will be reported each week in *Metals and Minerals*. The following prices, as quoted on July 9, 1959, have changed during the past week :

Gold 249s. 9½d., silver 78d. spot, 77½d. forward, wolfram and scheelite (65 per cent) 94s. 6d. - 99s. 6d. per unit c.i.f., zircon sand (Australian) (65-66 per cent ZrO_2) £16-£17 per ton c.i.f.

DISPUTE IN THE PRINTING INDUSTRY

While the present disputes in the printing industry continue, production of *The Mining Journal* is severely hampered. The size of each issue will continue to be governed by current circumstances, and certain regular features may have to be curtailed or omitted. From time to time there may also be some delay in distribution.

GENERAL MINING AND FINANCE CORPORATION LIMITED

(Incorporated in the Union of South Africa)

CHAIRMAN'S REVIEW

The following is **Sir George Albu's** Review covering the Operations of the General Mining and Finance Corporation Limited during the year ended December 31, 1958.

I am pleased that it is possible for me, in opening my review, which covers the progress of the Corporation during its sixty-third year of operations, to refer to the increased dividend declared on the Ordinary shares for that financial year. The dividend income of the Corporation for the past financial year was 25 per cent more than that of the previous year, due mainly to the increasing dividends declared by mines in the Orange Free State and in the Klerksdorp area. In addition to this large increase in revenue, an opportunity arose during 1958 to dispose of a substantial portfolio of investments on favourable terms to the American-South African Investment Company Limited. These events resulted in material improvements in both the profits and the financial position of the Corporation, and your Directors, therefore, were enabled not only to increase the dividend for the year on the Ordinary shares from 5s. to 6s. per share but also to place an amount in excess of £1,250,000 to Reserves. Reference to the Balance Sheet will show that the excess of current liabilities over current assets had been reduced to £473,000 at December 31, 1958, an improvement of £928,000 in comparison with the previous year's deficiency of £1,401,000.

During the year the Corporation took up rights accruing to it from its shareholdings in various companies and in addition purchased a substantial portfolio of shares in some of the newer mines to replace a portion of the investments sold to the American-South African Investment Company Limited. The financial position is not yet as liquid as it might be, and although opportunities for additional investment will arise continually, there should be some scope, in due course, in the margin of future net profits to improve liquidity gradually.

In my address to shareholders at the last Annual General Meeting I gave a résumé of the growth that had taken place over the last decade in this Corporation, and in the value of its investment portfolio. As compared with a market value of its portfolio of £15,700,000 at the end of 1957, the figure had improved to £22,100,000 at the end of December last, with a further improvement to £26,300,000 at March 31, 1959.

The Corporation's interests in the older mines of the Witwatersrand at the end of 1957 comprised one-fifth in value of its portfolio at that time, but the position has now altered with changing market prices and today less than 15 per cent of the Corporation's holdings is in the older mines. I think shareholders will agree that this is a happy position and with the Orange Free State and Klerksdorp goldfields still in the developing stage, with some mines not yet in full production, it is to be expected that the dividend income of the Corporation should increase annually for some years to come.

One of the major contributions towards the improved position of the Corporation at the end of 1958, arose from its interest in Free State Geduld Mines Limited. The development which was disclosed by the Chairman of Free State Geduld at the recent Annual General Meeting was without precedent in deep level mining in the South African goldfields. Although the extent of the very rich area then under discussion comprised only 215 feet at which stage the reef was faulted out, it is gratifying to note that the Directors' Report for the quarter ended March 31, 1959, has disclosed that the reef has again been intersected and 25 feet sampled gave values in excess of 4,000 inch-dwts. With values of this order it is apparent that Free State Geduld has a most promising future.

Among the Corporation's recently acquired interests, the most important has been in the Riebeeck Gold Mining Company Limited, now merged with Loraine Gold Mines Limited following the approval of shareholders in November last. The Chairman of the Company at the recent Annual General Meeting reported that No. 3 shaft (formerly No. 1 in the Riebeeck area) is expected to reach its final depth in December, 1959, and the small amount of development in the Elsburg (Upper) Reefs in the northern portion of the former Riebeeck area had disclosed promising values. We shall look forward to further disclosures in this interesting area.

The supply of European labour in the Industry shows some signs of improvement, but there are still shortages in certain categories. The supply of Native labour has recently attained the highest levels known in the Industry for some years and is now practically sufficient to meet the requirements of the Industry.

During the year under review, representatives of the Combined Development Agency visited South Africa for discussions with the Atomic Energy Board. These discussions resulted in an agreement to limit the maximum quantity of uranium oxide that will be purchased by the Combined Development Agency to 6,200 tons per annum. There is provision, however, for the periodical reduction of this total after the year 1963, as and when the various sales contracts entered into by individual producers with the Agency expire.

None of the uranium producers in this group will suffer a diminution in their present scale of operations, but Buffelsfontein may, under certain circumstances, obtain an increase in its quota of some 86,000 lbs. of uranium oxide per annum. There is no restriction on the disposal elsewhere by the Atomic Energy Board of any production of uranium oxide in excess of the 6,200 tons.

It is of the utmost importance that steps should be taken by the Government to ensure that South Africa will be in the forefront in any market that might develop for uranium as and when the contracts with the Combined Development Agency expire, and to this extent it is interesting to note that the initial steps have been taken. You will have noticed in the press recently a news paragraph to the effect that a Sales Survey Team from South Africa, in which the Mining Industry is represented, has proceeded overseas. The purpose of the visit is to study markets at first hand and to make personal contact with those who are responsible for the procurement of their respective countries' requirements of uranium oxide.

Although there was a further improvement in the net national income of the Union in 1958, the rate of increase declined noticeably as compared with the immediately preceding years, and the indices of activity in certain sectors of the economy suggested a downward trend. This was noticeable, for example, in farming, building and construction, manufacturing, real estate sales and mining, other than gold mining. The high levels of employment obtaining in recent years tended to decline, except in the gold mining industry in which the decline elsewhere gave rise to a freer supply of labour.

The Union's external trade was marked by a further increase of some £10,000,000 in imports to £568,000,000, and a sharp decline in exports from £446,000,000 to £384,000,000 due primarily to falling commodity prices. The incidence of increased imports fell mainly in the first half of the year, following the relaxation of controls in the closing months of 1957. The gold and foreign exchange reserves declined to the low level of £72,000,000 in May 1958, forcing the authorities to impose measures designed to reverse this trend.

Bank credit was restricted by the application of supplementary reserve requirements to the commercial banks, with successive increases between June and October to a maximum of 8 per cent, subsequently reduced to 6 per cent in November. Some interest rates were raised, the banks were requested to exercise considerable caution in making advances for the importation of goods and there was stricter control of foreign exchange for Union residents. Further restrictions on the importation of motor vehicles were introduced, coupled with a tightening of hire purchase regulations and the imposition of increases in some customs and excise duties.

During 1958 signs of a recession were to be found in most countries, with business becoming increasingly competitive and commodity prices generally declining. It might, therefore, have been expected that there would be some reduction in the working costs of the South African gold mining industry, but these costs continued to rise. Nevertheless, with the improving labour supply and the gradual development of the newer and richer mines on the Far West Rand, in the Klerksdorp area and in the Orange Free State, the gold mining industry made very satisfactory progress. The value of gold production increased by over £7,000,000 to a total of £220,000,000, and the value of uranium exported increased by £3,000,000 to £53,000,000, a total of £273,000,000, equivalent to over 47 per cent of the large bill for imports.

In the second half of the year world attention was increasingly directed to the

importance of South African gold mining shares as a hedge against the continuing depreciation in the true values of currencies, and there was a sharp upward movement on the Johannesburg Stock Exchange, which has continued into 1959, both in the volume of business transacted and in share prices. The net inflow of capital funds to the Union in 1958 was about £86,000,000, of which £55,000,000 was estimated to have been derived from the movement of privately owned capital, much of which was no doubt invested in South African gold shares. For this reason, and following the control measures already referred to, there was a gradual improvement in the gold and foreign exchange reserves to £112,000,000 at the year end, and since then to a higher level.

It should be obvious to those in authority that, while other sectors of the economy are less favourably situated, the gold mining industry is playing its usual very important part as a stabilising factor by providing an impressive and increasing amount of foreign exchange and by attracting substantial capital to the Union. It is, therefore, imperative that future fiscal and other policies of the Government be such as to ensure not only a reasonable return on investments in gold shares, but also an atmosphere of security for overseas and local potential investors.

For some years now the Union of South Africa has encountered difficulty in obtaining sufficient capital funds. With a view to encouraging the flow of foreign capital to the Union the Government last year exempted from taxation profits earned by companies on the sale of shares or gold bullion if the shares or gold are acquired with funds transferred to the Union from overseas for this purpose, or with funds derived from the shares so purchased arising either from their realization or from dividends received.

Existing Finance Companies domiciled in South Africa would have great difficulty in taking advantage of this exemption and these Companies are, therefore, at a disadvantage in competition with the class of Companies which enjoy the amendment to the taxation laws. The domestic Companies are also subject to a further disability if they fall within the orbit of the Undistributed Profits Tax provisions.

Mining Companies have limited lives and if the Gold Mining Industry is to continue to play its present major part in the economy of the Union it is necessary for the Companies which finance mining development to pursue their present practice of re-investing in new mines profits made on the realization of shares in the older Mining Companies. With this in view most Finance Companies refrain from distributing by way of dividends any major portion of profits arising from share realizations, but place these surpluses to Reserves where they are available for financing new development. The incidence of Undistributed Profits Tax on such profits is particularly unfortunate in that it severely limits this policy, and it is desirable that the Minister of Finance should give full consideration to this aspect of the tax, especially in view of the exemption from taxation granted to foreign capital, to which I have already referred.

During the latter part of last year and up until the date of the issue of this Review, there have been certain statements made by the Minister concerned in regard to the sale of gold. It has been reported that the Reserve Bank will be prepared to sell gold in bar form in quantities of 25,000 ounces. Although there has been a great deal of speculation on the price of gold, this is a matter in which America is largely concerned, and while the sale to specified buyers through the Reserve Bank is desirable in order to attract foreign currency, such sales cannot affect the position of internal illiquidity which now exists among the leading countries of the World. While it is understandable that the United States of America do not wish to pay a higher price for gold at the moment, I am convinced that the international monetary situation is such that eventually the price must rise. Every economic factor as at present known to us points to this being the logical conclusion of the financial policies being pursued in certain countries. In the meantime I think it would be advisable for the use of gold to be more widely appreciated by the masses of the people throughout the Western world. I, therefore, hope that the South African Government will permit the Mining Industry to dispose of a proportion of its gold either in the form of small bars, coinage or medallions and that this will encourage a generation which has never appreciated the true value of the metal to realize that it has some property which has made it the basis of international dealing throughout the centuries.

Book Reviews

Mineralogy: An introduction to the study of Minerals and Crystals, *by Edward Henry Kraus, Walter Fred Hunt, and Lewis Stephen Ramsdell. Fifth edition. McGraw-Hill Book Company. 686 pages (including 20 pages of index). Price 70s.*

This new edition of a book described as an introduction to the study of Minerals and Crystals, and first published in 1920, has been thoroughly revised and enlarged by 22 pages. Many chapters have been entirely rewritten and expanded; for example, chapter 13, now entitled "Chemical Mineralogy and Crystal Chemistry" contains a new and excellent discussion of crystal chemistry, and chapter 14, which deals with "Formation and Occurrence of Rock and Minerals", has been completely revised.

The section dealing with descriptive mineralogy has suffered little change except to bring many formulae into line with modern interpretation of the chemical composition resulting from X-ray studies.

The book comprises 478 pages of text, followed by a glossary, a tabular classification showing the element of symmetry and the simple forms of the thirty-two classes of crystals, tables for determining minerals by means of their physical properties, a selected bibliography (subdivided for easy reference), and an index, which accounts for a further 208 pages.

Before dealing with purely descriptive mineralogy, which only occupies about one-third of the text, apart from tables, very useful chapters are provided on crystallography, physical properties of minerals, optical mineralogy, crystal structure and X-ray analysis, chemical mineralogy and crystal symmetry, formation and occurrence of rocks and minerals, and qualitative blowpipe methods.

The chapters on crystal structure and X-ray analysis, and on chemical mineralogy and crystal symmetry, perhaps deserve special mention, as the subjects are simply explained yet well covered, so that the connection between space lattices, atomic groups and atomic planes, and crystal shape, as well as other properties, is readily understood.

A valuable chapter on gemstones and a useful classification of minerals according to elements is also included, and in the concluding tables for the determination of minerals, lustre and colour, streak and hardness, are employed as the main basis of identification, supplemented by noting cleavage, fracture sp. gr., and other characteristics which are listed for each mineral species.

Although not new in concept, the present classification appears good.

If any criticism is to be levelled at the book, it is that little or nothing has been said about micro chemical tests and staining techniques, which can be extremely valuable for identifying small particles of minerals, and one would have thought that some of the more common tests would have been included. For example, no mention is made of the azide test for sulphide minerals or the potassium iodide/nitric acid test for cirrusite, to cite only two very simple ones.

On the whole, however, this new edition of a book which has been widely used in the United States for many years is to be thoroughly recommended. The subject matter has been carefully arranged for easy reference and is not only valuable to the student of mineralogy but also to the practising geologist, mining engineer, or mineral dresser, because in addition to the good descriptive section, the preceding chapters provide an excellent basis of fundamental principles involved in the study of the subject.

*

Copper and its alloys are used in some form or another in practically every branch of industry. The Copper Development Association, in order to draw attention to the latest developments in the world of copper, now produce a publication each month which contains abstracts based on a survey of some of 120 technical journals and other relevant media, supplemented by detailed reproduction from other abstract journals. The publication is entitled *Copper Abstracts*, and the subject matter, devoted exclusively to copper and its alloys, is classified under appropriate sub-headings. Each abstract is serially numbered for indexing in the December issue of each year.

*

The important part now played by polyvinyl chloride in every walk of life is the theme of *The Geon Story*, a publication recently issued by British Geon Ltd. More PVC is produced in Britain today than any other plastics material. At 100,000 tons a year, PVC represents one-quarter of the total annual British plastics production (400,000 tons). *The Geon Story* tells, for example, of the vital role played by PVC in mining, where, by replacing many hundreds of miles of rubber conveyor belting with non-flammable PVC belting, the underground fire hazard has been substantially reduced. Other coal mining uses of this material include ventilation ducting brattice cloth, and miners' knee pads.